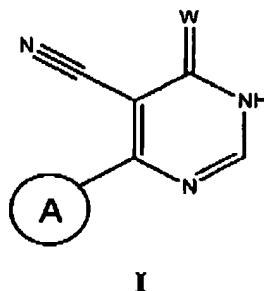


Applicants: Young-Choon Moon
 Application No.: 10/799,507

AMENDMENTS TO THE CLAIMS

Please replace all prior versions and listings of claims with the amended claims as follows:

1. (Currently amended) A compound of formula I:



or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur;

ring A is a 5-6 membered aryl, heterocyclyl or heteroaryl ring having 0-4 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

wherein ring A is optionally substituted with 1-4 groups independently selected from halo, $-R^1$, aliphatic, aryl, heteroaryl or heterocyclyl, wherein said aliphatic, aryl, heteroaryl or heterocyclyl is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, $-CN$, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)N(R^2)_2$, $=O$, $=S$, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur:
 $-SR^1$, $-NO_2$, $-CN$, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-NR^1C(O)N(R^1)_2$, $-NR^1CO_2R^1$, $-NR^1NR^1C(O)R^1$, $-NR^1NR^1C(O)N(R^1)_2$, $-NR^1NR^1CO_2R^1$, $-C(O)C(O)R^1$,

Applicants: Young-Choon Moon
 Application No.: 10/799,507

$-\text{C}(\text{O})\text{CH}_2\text{C}(\text{O})\text{R}^1$, $-\text{CO}_2\text{R}^1$, $-\text{C}(\text{O})\text{R}^1$, $-\text{C}(\text{O})\text{N}(\text{R}^1)_2$, $-\text{OC}(\text{O})\text{N}(\text{R}^1)_2$, $-\text{S}(\text{O})_2\text{R}^1$, $-\text{SO}_2\text{N}(\text{R}^1)_2$, $-\text{S}(\text{O})\text{R}^1$, $-\text{NR}^1\text{SO}_2\text{R}^1$, $-\text{NR}^1\text{SO}_2\text{N}(\text{R}^1)_2$, $-\text{C}(=\text{S})\text{N}(\text{R}^1)_2$, $-\text{C}(=\text{NH})-\text{N}(\text{R}^1)_2$, $=\text{O}$, $=\text{S}$, $=\text{NNHR}^1$, $=\text{NN}(\text{R}^1)_2$, $=\text{NNHC}(\text{O})\text{R}^1$, $=\text{NNHCO}_2(\text{R}^1)$, $=\text{NNHSO}_2(\text{R}^1)$, or $=\text{NR}^1$, wherein two independent occurrences of R^1 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 3-8 membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^1 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^1 except hydrogen is optionally substituted with halo, $-\text{R}^2$, $-\text{OR}^2$, $-\text{SR}^2$, $-\text{NO}_2$, $-\text{CN}$, $-\text{N}(\text{R}^2)_2$, $-\text{NR}^2\text{C}(\text{O})\text{R}^2$, $-\text{NR}^2\text{C}(\text{O})\text{N}(\text{R}^2)_2$, $-\text{NR}^2\text{CO}_2\text{R}^2$, $-\text{NR}^2\text{NR}^2\text{C}(\text{O})\text{R}^2$, $-\text{NR}^2\text{NR}^2\text{C}(\text{O})\text{N}(\text{R}^2)_2$, $-\text{NR}^2\text{NR}^2\text{CO}_2\text{R}^2$, $-\text{C}(\text{O})\text{C}(\text{O})\text{R}^2$, $-\text{C}(\text{O})\text{CH}_2\text{C}(\text{O})\text{R}^2$, $-\text{CO}_2\text{R}^2$, $-\text{C}(\text{O})\text{R}^2$, $-\text{C}(\text{O})\text{N}(\text{R}^2)_2$, $-\text{OC}(\text{O})\text{N}(\text{R}^2)_2$, $-\text{S}(\text{O})_2\text{R}^2$, $-\text{SO}_2\text{N}(\text{R}^2)_2$, $-\text{S}(\text{O})\text{R}^2$, $-\text{NR}^2\text{SO}_2\text{R}^2$, $-\text{NR}^2\text{SO}_2\text{N}(\text{R}^2)_2$, $-\text{C}(=\text{S})\text{N}(\text{R}^2)_2$, $-\text{C}(=\text{NH})-\text{N}(\text{R}^2)_2$, $=\text{O}$, $=\text{S}$, $=\text{NNHR}^2$, $=\text{NN}(\text{R}^2)_2$, $=\text{NNHC}(\text{O})\text{R}^2$, $=\text{NNHCO}_2(\text{R}^2)$, $=\text{NNHSO}_2(\text{R}^2)$, or $=\text{NR}^2$, wherein two independent occurrences of R^2 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-\text{R}^3$, $-\text{OR}^3$, $-\text{SR}^3$, $-\text{NO}_2$, $-\text{CN}$, $-\text{N}(\text{R}^3)_2$, $-\text{NR}^3\text{C}(\text{O})\text{R}^3$, $-\text{NR}^3\text{C}(\text{O})\text{N}(\text{R}^3)_2$, $-\text{NR}^3\text{CO}_2\text{R}^3$, $-\text{NR}^3\text{NR}^3\text{C}(\text{O})\text{R}^3$, $-\text{NR}^3\text{NR}^3\text{C}(\text{O})\text{N}(\text{R}^3)_2$, $-\text{NR}^3\text{NR}^3\text{CO}_2\text{R}^3$, $-\text{C}(\text{O})\text{C}(\text{O})\text{R}^3$, $-\text{C}(\text{O})\text{CH}_2\text{C}(\text{O})\text{R}^3$, $-\text{CO}_2\text{R}^3$, $-\text{C}(\text{O})\text{R}^3$, $-\text{C}(\text{O})\text{N}(\text{R}^3)_2$, $-\text{OC}(\text{O})\text{N}(\text{R}^3)_2$, $-\text{S}(\text{O})_2\text{R}^3$, $-\text{SO}_2\text{N}(\text{R}^3)_2$, $-\text{S}(\text{O})\text{R}^3$, $-\text{NR}^3\text{SO}_2\text{R}^3$, $-\text{NR}^3\text{SO}_2\text{N}(\text{R}^3)_2$, $-\text{C}(=\text{S})\text{N}(\text{R}^3)_2$, $-\text{C}(=\text{NH})-\text{N}(\text{R}^3)_2$, $=\text{O}$, $=\text{S}$, $=\text{NNHR}^3$, $=\text{NN}(\text{R}^3)_2$, $=\text{NNHC}(\text{O})\text{R}^3$, $=\text{NNHCO}_2(\text{R}^3)$, $=\text{NNHSO}_2(\text{R}^3)$, or $=\text{NR}^3$; and

each R^3 is independently hydrogen or unsubstituted aliphatic;
 provided that when ring A is phenyl, it must be substituted.

Applicants: Young-Choon Moon
 Application No.: 10/799,507

2. (Original) The compound of claim 1, wherein W is oxygen.
3. (Original) The compound of claim 1, wherein W is sulfur.
4. (Currently amended) The compound of claim 2 or 3, wherein ring A is phenyl substituted with 1-4 groups independently selected from halo; $-R^1$; aliphatic, aryl, heteroaryl or heterocyclyl, wherein said aliphatic, aryl, heteroaryl or heterocyclyl is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, $-CN$, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)N(R^2)_2$, $=O$, $=S$, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur; $-SR^1$, $-NO_2$, $-CN$, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-NR^1C(O)N(R^1)_2$, $-NR^1CO_2R^1$, $-NR^1NR^1C(O)R^1$, $-NR^1NR^1C(O)N(R^1)_2$, $-NR^1NR^1CO_2R^1$, $-C(O)C(O)R^1$, $-C(O)CH_2C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-OC(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-S(O)R^1$, $-NR^1SO_2R^1$, $-NR^1SO_2N(R^1)_2$, $-C(=S)N(R^1)_2$, or $-C(=NH)N(R^1)_2$, wherein two independent occurrences of R^1 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 5-7-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-2 heteroatoms independently selected from N, O or S.
5. (Currently amended) The compound of claim 4, wherein ring A is phenyl substituted with 1-4 groups independently selected from halo; $-R^1$; aliphatic, aryl, heteroaryl or heterocyclyl, wherein said aliphatic, aryl, heteroaryl or heterocyclyl is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, $-CN$, $-N(R^2)_2$, $-NR^2C(O)R^2$

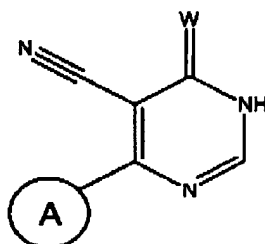
Applicants: Young-Choon Moon
 Application No.: 10/799,507

-NR²C(O)N(R²)₂, -NR²CO₂R², -NR²NR²C(O)R², -NR²NR²C(O)N(R²)₂, -NR²NR²CO₂R², -C(O)C(O)R², -C(O)CH₂C(O)R², -CO₂R², -C(O)R², -C(O)N(R²)₂, -OC(O)N(R²)₂, -S(O)₂R², -SO₂N(R²)₂, -S(O)R², -NR²SO₂R², -NR²SO₂N(R²)₂, -C(=S)N(R²)₂, -C(=NH)-N(R²)₂, =O, =S, =NNHR², =NN(R²)₂, =NNHC(O)R², =NNHCO₂(R²), =NNHSO₂(R²), or =NR², wherein two independent occurrences of R², on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R² group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur; -SR¹, -NO₂, -CN, -N(R¹)₂, -NR¹C(O)R¹, -CO₂R¹, -C(O)R¹, -C(O)N(R¹)₂, -S(O)₂R¹, -SO₂N(R¹)₂, -NR¹SO₂R¹, or -C(=S)N(R¹)₂, wherein two independent occurrences of R¹, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R¹ group is bound, form a 5-7-membered heterocyclyl, aryl, or heteroaryl ring having 0-2 heteroatoms independently selected from N, O or S.

6. (Currently amended) The compound of claim ~~21~~ 23, wherein ring A is a 5-6 membered heterocyclyl or heteroaryl ring having 1-2 heteroatoms independently selected from N, O or S, wherein ring A is optionally substituted with 1-4 groups independently selected from halo, -R¹, -OR¹, -SR¹, -NO₂, -CN, -N(R¹)₂, -NR¹C(O)R¹, -CO₂R¹, -C(O)R¹, -C(O)N(R¹)₂, -S(O)₂R¹, -SO₂N(R¹)₂, -NR¹SO₂R¹, or -C(=S)N(R¹)₂, wherein two independent occurrences of R¹, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R¹ group is bound, form a 5-7-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-2 heteroatoms independently selected from N, O or S.

7. (Previously presented) A compound of formula I:

Applicants: Young-Choon Moon
 Application No.: 10/799,507



I

or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur;

ring A is naphthyl, benzodioxolyl, dihydrobenzodioxinyl, benzothiazolyl, benzoimidazolyl, or dihydrobenzo[b][1,4]dioxepinyl, wherein each member of ring A is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, $-CN$, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-NR^2SO_2R^2$, or $-C(=S)N(R^2)_2$;

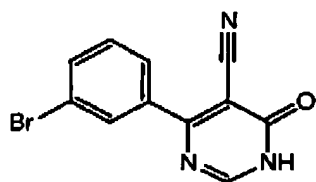
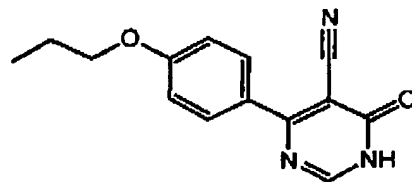
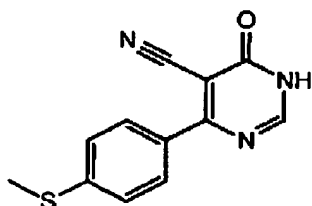
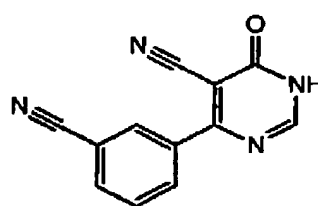
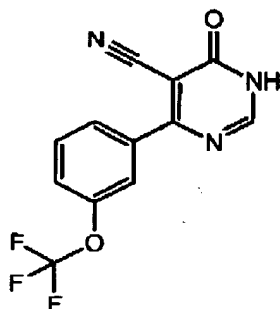
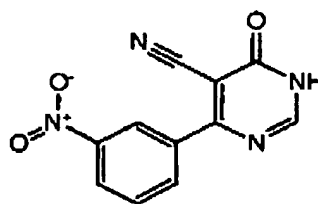
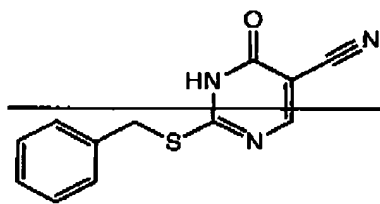
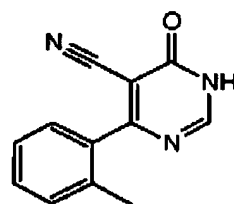
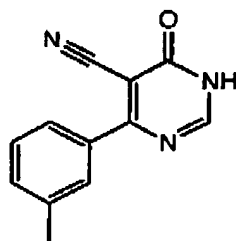
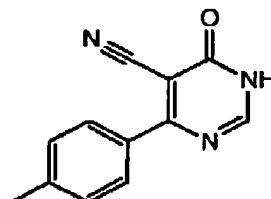
each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-R^3$, $-OR^3$, $-SR^3$, $-NO_2$, $-CN$, $-N(R^3)_2$, $-NR^3C(O)R^3$, $-NR^3C(O)N(R^3)_2$, $-NR^3CO_2R^3$, $-NR^3NR^3C(O)R^3$, $-NR^3NR^3C(O)N(R^3)_2$, $-NR^3NR^3CO_2R^3$, $-C(O)C(O)R^3$, $-C(O)CH_2C(O)R^3$, $-CO_2R^3$, $-C(O)R^3$, $-C(O)N(R^3)_2$, $-OC(O)N(R^3)_2$, $-S(O)_2R^3$, $-SO_2N(R^3)_2$, $-S(O)R^3$, $-NR^3SO_2R^3$, $-NR^3SO_2N(R^3)_2$, $-C(=S)N(R^3)_2$, $-C(=NH)-N(R^3)_2$, $=O$, $=S$, $=NNHR^3$, $=NN(R^3)_2$, $=NNHC(O)R^3$, $=NNHCO_2(R^3)$, $=NNHSO_2(R^3)$, or $=NR^3$; and

each R^3 is independently hydrogen or unsubstituted aliphatic.

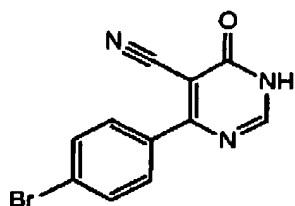
8. (Previously presented) The compound of claim 21, wherein ring A is pyridinonyl, tetrahydro-quinolinyl, pyridyl, or thiazolyl, wherein each member of ring A is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, $-CN$, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-NR^2SO_2R^2$, or $-C(=S)N(R^2)_2$.

Applicants: Young-Choon Moon
Application No.: 10/799,507

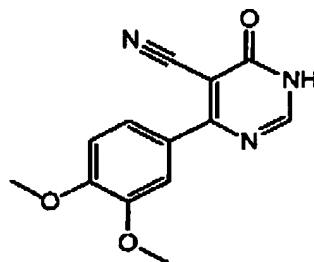
9. (Currently amended) A compound selected from:

**I-3****I-4****I-5****I-6****I-7****I-8****I-9****I-10****I-11****I-12**

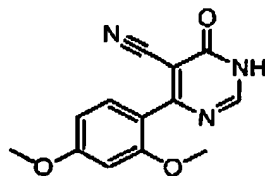
Applicants: Young-Choon Moon
Application No.: 10/799,507



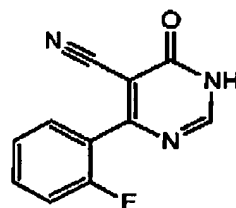
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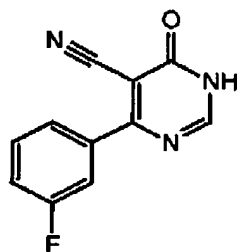
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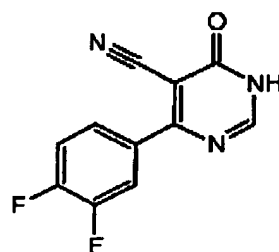
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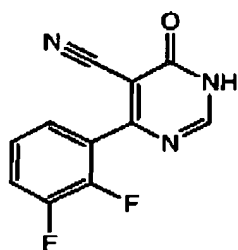
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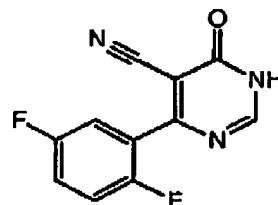
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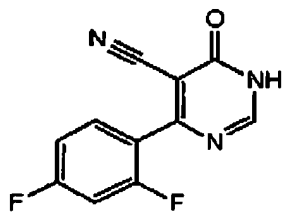
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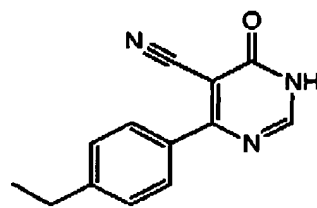
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I-20

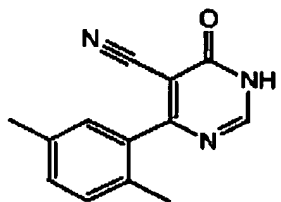


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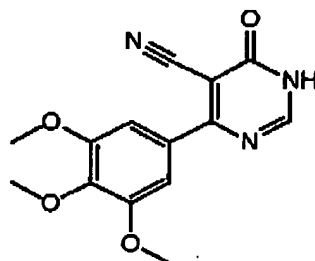


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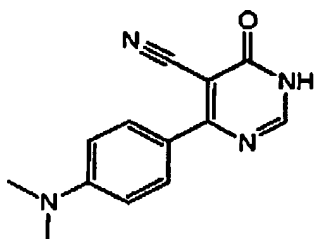
Applicants: Young-Choon Moon
Application No.: 10/799,507



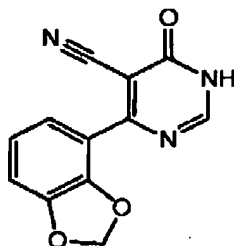
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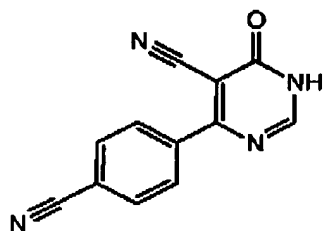
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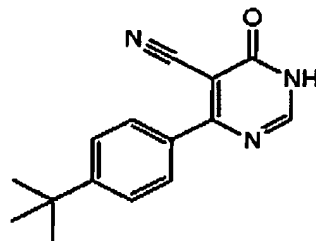
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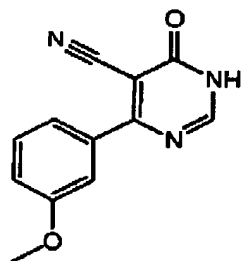
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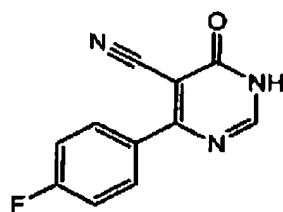
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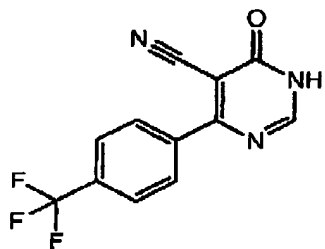
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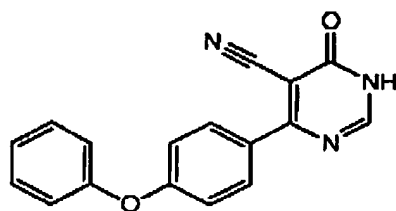
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I-30

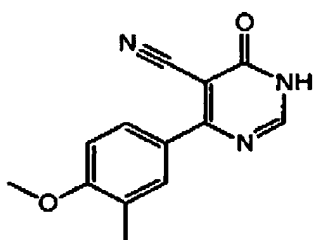


I-31

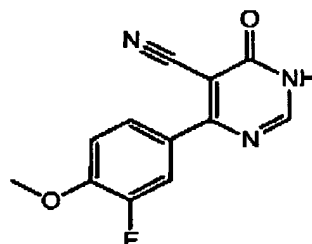


I-32

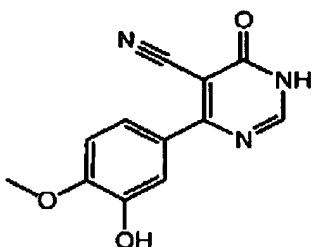
Applicants: Young-Choon Moon
Application No.: 10/799,507



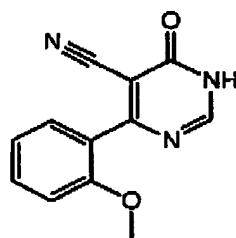
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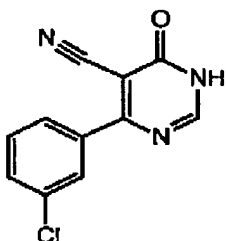
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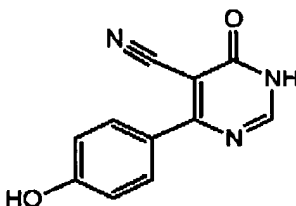
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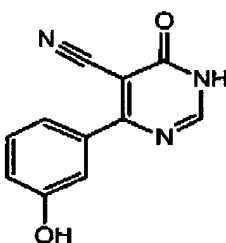
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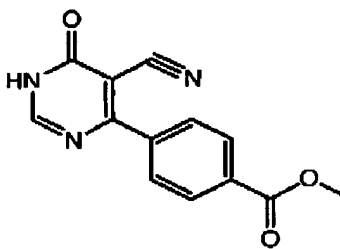
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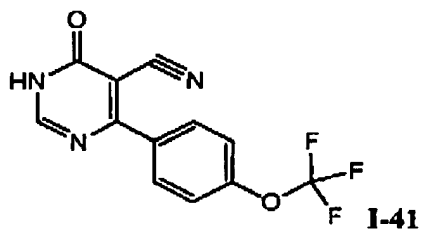
I-38



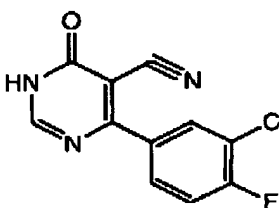
I-39



I-40

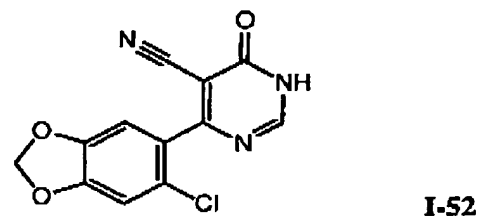
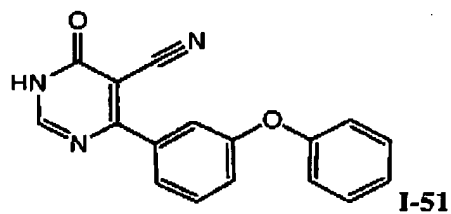
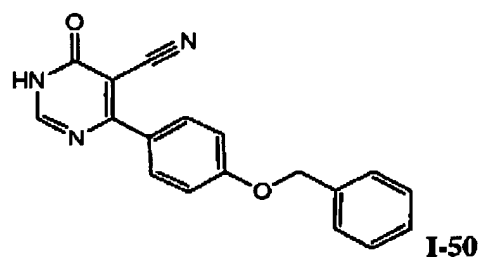
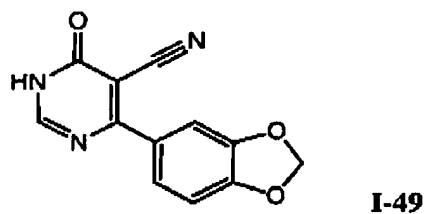
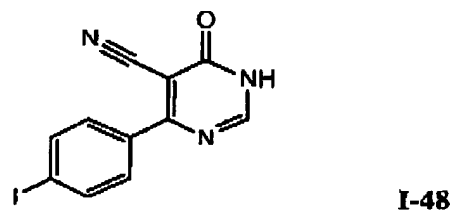
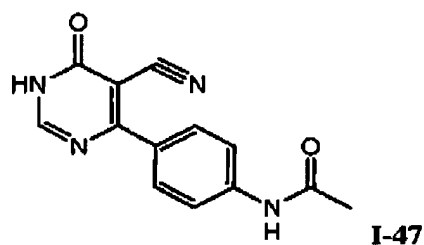
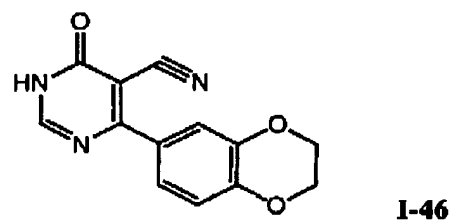
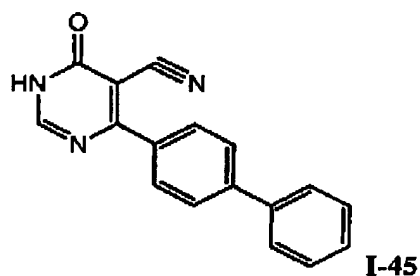
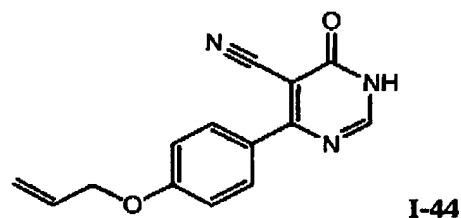
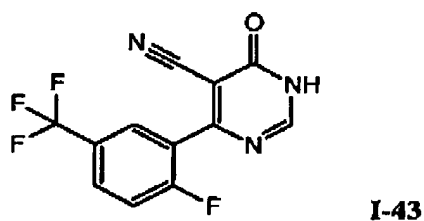


I-41

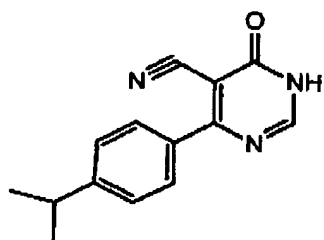


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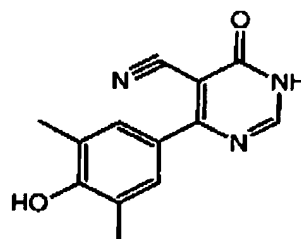
Applicants: Young-Choon Moon
Application No.: 10/799,507



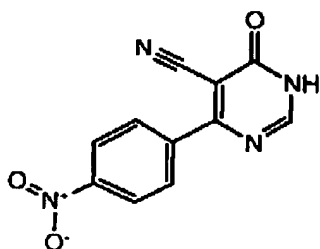
Applicants: Young-Choon Moon
Application No.: 10/799,507



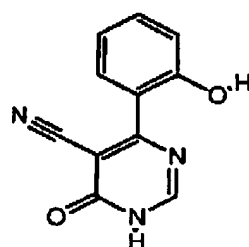
I-53



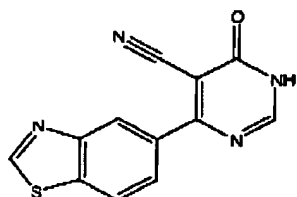
I-54



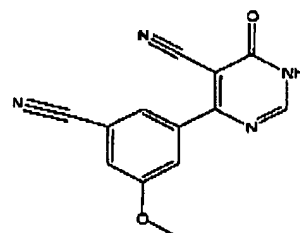
I-55



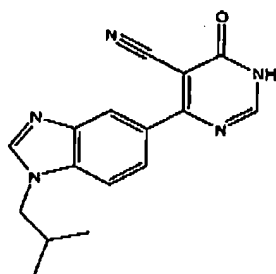
I-56



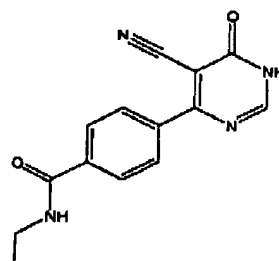
I-57



I-58

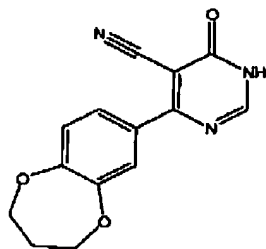
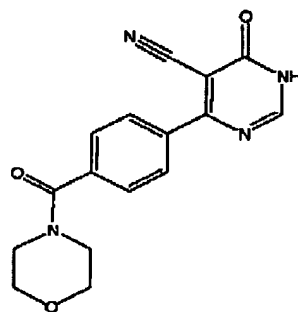
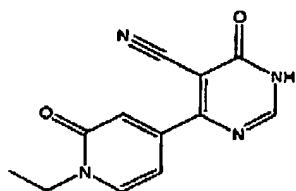
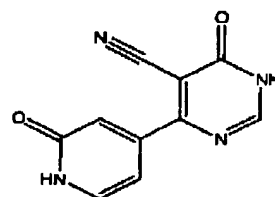
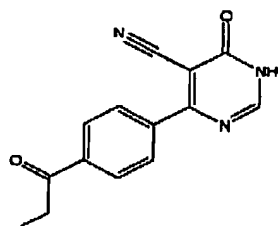
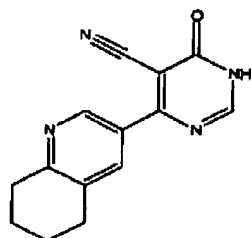
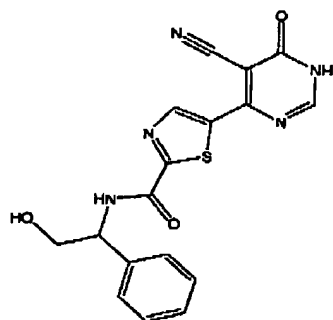
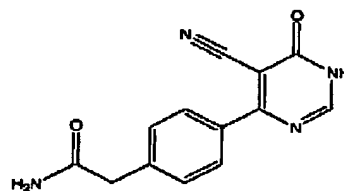


I-59

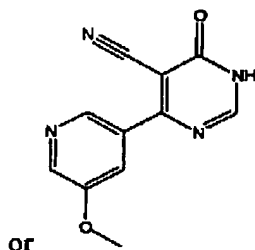


I-60

Applicants: Young-Choon Moon
Application No.: 10/799,507

**I-61****I-62****I-63****I-64****I-65****I-66****I-67****I-68**

Applicants: Young-Choon Moon
 Application No.: 10/799,507

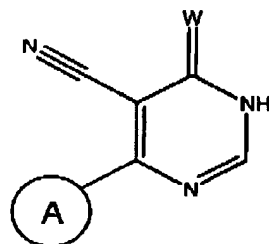


I-69.

10. (Currently amended) A composition comprising a compound of claim 1, 7, [[or]] 9, 21 or 22, and a pharmaceutically acceptable carrier, adjuvant, or vehicle.

11. (Currently amended) The composition of claim 10, additionally comprising ~~a therapeutic agent selected from an anti-inflammatory agent, an immunomodulatory or immune suppressive agent, a neurotrophic factor, an agent for treating cardiovascular disease, an agent for treating liver disease, an anti-viral agent, an agent for treating blood disorders,~~ an agent for treating diabetes, ~~or an agent for treating immunodeficiency disorders.~~

12. (Previously presented) A method of inhibiting GSK-3 activity in:
 a biological sample;
 which method comprises contacting said biological sample with a compound of formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:
 W is oxygen or sulfur;

Applicants: Young-Choon Moon
 Application No.: 10/799,507

ring A is a 5-6 membered aryl, heterocyclyl or heteroaryl ring having 0-4 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

wherein ring A is optionally substituted with 1-4 groups independently selected from halo, $-R^1$, $-OR^1$, $-SR^1$, $-NO_2$, $-CN$, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-NR^1C(O)N(R^1)_2$, $-NR^1CO_2R^1$, $-NR^1NR^1C(O)R^1$, $-NR^1NR^1C(O)N(R^1)_2$, $-NR^1NR^1CO_2R^1$, $-C(O)C(O)R^1$, $-C(O)CH_2C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-OC(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-S(O)R^1$, $-NR^1SO_2R^1$, $-NR^1SO_2N(R^1)_2$, $-C(=S)N(R^1)_2$, $-C(=NH)-N(R^1)_2$, $=O$, $=S$, $=NNHR^1$, $=NN(R^1)_2$, $=NNHC(O)R^1$, $=NNHCO_2(R^1)$, $=NNHSO_2(R^1)$, or $=NR^1$, wherein two independent occurrences of R^1 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^1 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^1 except hydrogen is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, $-CN$, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)-N(R^2)_2$, $=O$, $=S$, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-R^3$, $-OR^3$, $-SR^3$, $-NO_2$, $-CN$, $-N(R^3)_2$, $-NR^3C(O)R^3$, $-NR^3C(O)N(R^3)_2$, $-NR^3CO_2R^3$, $-NR^3NR^3C(O)R^3$, $-NR^3NR^3C(O)N(R^3)_2$, $-NR^3NR^3CO_2R^3$, $-C(O)C(O)R^3$, $-C(O)CH_2C(O)R^3$, $-CO_2R^3$, $-C(O)R^3$, $-C(O)N(R^3)_2$, $-OC(O)N(R^3)_2$, $-S(O)_2R^3$,

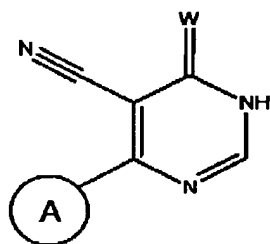
Applicants: Young-Choon Moon
 Application No.: 10/799,507

$-\text{SO}_2\text{N}(\text{R}^3)_2$, $-\text{S}(\text{O})\text{R}^3$, $-\text{NR}^3\text{SO}_2\text{R}^3$, $-\text{NR}^3\text{SO}_2\text{N}(\text{R}^3)_2$, $-\text{C}(=\text{S})\text{N}(\text{R}^3)_2$, $-\text{C}(=\text{NH})-\text{N}(\text{R}^3)_2$,
 $=\text{O}$, $=\text{S}$, $=\text{NNHR}^3$, $=\text{NN}(\text{R}^3)_2$, $=\text{NNHC}(\text{O})\text{R}^3$, $=\text{NNHCO}_2(\text{R}^3)$, $=\text{NNHSO}_2(\text{R}^3)$, or
 $=\text{NR}^3$; and

each R^3 is independently hydrogen or unsubstituted aliphatic; or
 a pharmaceutical composition comprising said compound and a
 pharmaceutically acceptable carrier, adjuvant, or vehicle;
 in an amount effective to inhibit GSK-3 activity.

13 to 16. (Canceled).

17. (Currently amended) A method of treating or lessening the severity of a
~~disease or condition selected from allergy, asthma, diabetes, Alzheimer's disease,~~
~~Huntington's disease, Parkinson's disease, AIDS-associated dementia, amyotrophic~~
~~lateral sclerosis (ALS, Lou Gehrig's disease), multiple sclerosis (MS), schizophrenia,~~
~~cardiomyocyte hypertrophy, reperfusion/ischemia, or baldness,~~ comprising
 administering to a patient a compound of formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur;

ring A is a 5-6 membered aryl, heterocyclyl or heteroaryl ring having 0-4
 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

wherein ring A is optionally substituted with 1-4 groups independently
 selected from halo, $-\text{R}^1$, $-\text{OR}^1$, $-\text{SR}^1$, $-\text{NO}_2$, $-\text{CN}$, $-\text{N}(\text{R}^1)_2$, $-\text{NR}^1\text{C}(\text{O})\text{R}^1$,
 $-\text{NR}^1\text{C}(\text{O})\text{N}(\text{R}^1)_2$, $-\text{NR}^1\text{CO}_2\text{R}^1$, $-\text{NR}^1\text{NR}^1\text{C}(\text{O})\text{R}^1$, $-\text{NR}^1\text{NR}^1\text{C}(\text{O})\text{N}(\text{R}^1)_2$.

Applicants: Young-Choon Moon
 Application No.: 10/799,507

$\text{NR}^1\text{NR}^1\text{CO}_2\text{R}^1$, $-\text{C}(\text{O})\text{C}(\text{O})\text{R}^1$, $-\text{C}(\text{O})\text{CH}_2\text{C}(\text{O})\text{R}^1$, $-\text{CO}_2\text{R}^1$, $-\text{C}(\text{O})\text{R}^1$, $-\text{C}(\text{O})\text{N}(\text{R}^1)_2$, $-\text{OC}(\text{O})\text{N}(\text{R}^1)_2$, $-\text{S}(\text{O})_2\text{R}^1$, $-\text{SO}_2\text{N}(\text{R}^1)_2$, $-\text{S}(\text{O})\text{R}^1$, $-\text{NR}^1\text{SO}_2\text{R}^1$, $-\text{NR}^1\text{SO}_2\text{N}(\text{R}^1)_2$, $-\text{C}(=\text{S})\text{N}(\text{R}^1)_2$, $-\text{C}(=\text{NH})-\text{N}(\text{R}^1)_2$, $=\text{O}$, $=\text{S}$, $=\text{NNHR}^1$, $=\text{NN}(\text{R}^1)_2$, $=\text{NNHC}(\text{O})\text{R}^1$, $=\text{NNHCO}_2(\text{R}^1)$, $=\text{NNHSO}_2(\text{R}^1)$, or $=\text{NR}^1$, wherein two independent occurrences of R^1 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^1 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^1 except hydrogen is optionally substituted with halo, $-\text{R}^2$, $-\text{OR}^2$, $-\text{SR}^2$, $-\text{NO}_2$, $-\text{CN}$, $-\text{N}(\text{R}^2)_2$, $-\text{NR}^2\text{C}(\text{O})\text{R}^2$, $-\text{NR}^2\text{C}(\text{O})\text{N}(\text{R}^2)_2$, $-\text{NR}^2\text{CO}_2\text{R}^2$, $-\text{NR}^2\text{NR}^2\text{C}(\text{O})\text{R}^2$, $-\text{NR}^2\text{NR}^2\text{C}(\text{O})\text{N}(\text{R}^2)_2$, $-\text{NR}^2\text{NR}^2\text{CO}_2\text{R}^2$, $-\text{C}(\text{O})\text{C}(\text{O})\text{R}^2$, $-\text{C}(\text{O})\text{CH}_2\text{C}(\text{O})\text{R}^2$, $-\text{CO}_2\text{R}^2$, $-\text{C}(\text{O})\text{R}^2$, $-\text{C}(\text{O})\text{N}(\text{R}^2)_2$, $-\text{OC}(\text{O})\text{N}(\text{R}^2)_2$, $-\text{S}(\text{O})_2\text{R}^2$, $-\text{SO}_2\text{N}(\text{R}^2)_2$, $-\text{S}(\text{O})\text{R}^2$, $-\text{NR}^2\text{SO}_2\text{R}^2$, $-\text{NR}^2\text{SO}_2\text{N}(\text{R}^2)_2$, $-\text{C}(=\text{S})\text{N}(\text{R}^2)_2$, $-\text{C}(=\text{NH})-\text{N}(\text{R}^2)_2$, $=\text{O}$, $=\text{S}$, $=\text{NNHR}^2$, $=\text{NN}(\text{R}^2)_2$, $=\text{NNHC}(\text{O})\text{R}^2$, $=\text{NNHCO}_2(\text{R}^2)$, $=\text{NNHSO}_2(\text{R}^2)$, or $=\text{NR}^2$, wherein two independent occurrences of R^2 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-\text{R}^3$, $-\text{OR}^3$, $-\text{SR}^3$, $-\text{NO}_2$, $-\text{CN}$, $-\text{N}(\text{R}^3)_2$, $-\text{NR}^3\text{C}(\text{O})\text{R}^3$, $-\text{NR}^3\text{C}(\text{O})\text{N}(\text{R}^3)_2$, $-\text{NR}^3\text{CO}_2\text{R}^3$, $-\text{NR}^3\text{NR}^3\text{C}(\text{O})\text{R}^3$, $-\text{NR}^3\text{NR}^3\text{C}(\text{O})\text{N}(\text{R}^3)_2$, $-\text{NR}^3\text{NR}^3\text{CO}_2\text{R}^3$, $-\text{C}(\text{O})\text{C}(\text{O})\text{R}^3$, $-\text{C}(\text{O})\text{CH}_2\text{C}(\text{O})\text{R}^3$, $-\text{CO}_2\text{R}^3$, $-\text{C}(\text{O})\text{R}^3$, $-\text{C}(\text{O})\text{N}(\text{R}^3)_2$, $-\text{OC}(\text{O})\text{N}(\text{R}^3)_2$, $-\text{S}(\text{O})_2\text{R}^3$, $-\text{SO}_2\text{N}(\text{R}^3)_2$, $-\text{S}(\text{O})\text{R}^3$, $-\text{NR}^3\text{SO}_2\text{R}^3$, $-\text{NR}^3\text{SO}_2\text{N}(\text{R}^3)_2$, $-\text{C}(=\text{S})\text{N}(\text{R}^3)_2$, $-\text{C}(=\text{NH})-\text{N}(\text{R}^3)_2$, $=\text{O}$, $=\text{S}$, $=\text{NNHR}^3$, $=\text{NN}(\text{R}^3)_2$, $=\text{NNHC}(\text{O})\text{R}^3$, $=\text{NNHCO}_2(\text{R}^3)$, $=\text{NNHSO}_2(\text{R}^3)$, or $=\text{NR}^3$; and

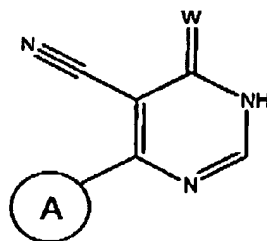
each R^3 is independently hydrogen or unsubstituted aliphatic; or

Applicants: Young-Choon Moon
 Application No.: 10/799,507

a pharmaceutical composition comprising said compound and a pharmaceutically acceptable carrier, adjuvant, or vehicle;

in an amount effective to treat or lessen the severity of said disease or condition.

18. (Previously presented) A method of treating or lessening the severity of stroke in a patient, comprising administering to said patient a compound of formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur;

ring A is a 5-6 membered aryl, heterocyclyl or heteroaryl ring having 0-4 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

wherein ring A is optionally substituted with 1-4 groups independently selected from halo, $-R^1$, $-OR^1$, $-SR^1$, $-NO_2$, $-CN$, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-NR^1C(O)N(R^1)_2$, $-NR^1CO_2R^1$, $-NR^1NR^1C(O)R^1$, $-NR^1NR^1C(O)N(R^1)_2$, $-NR^1NR^1CO_2R^1$, $-C(O)C(O)R^1$, $-C(O)CH_2C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-OC(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-S(O)R^1$, $-NR^1SO_2R^1$, $-NR^1SO_2N(R^1)_2$, $-C(=S)N(R^1)_2$, $-C(=NH)-N(R^1)_2$, $=O$, $=S$, $=NNHR^1$, $=NN(R^1)_2$, $=NNHC(O)R^1$, $=NNHCO_2(R^1)$, $=NNHSO_2(R^1)$, or $=NR^1$, wherein two independent occurrences of R^1 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

Applicants: Young-Choon Moon
 Application No.: 10/799,507

each R^1 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^1 except hydrogen is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, $-CN$, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)-N(R^2)_2$, $=O$, $=S$, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-R^3$, $-OR^3$, $-SR^3$, $-NO_2$, $-CN$, $-N(R^3)_2$, $-NR^3C(O)R^3$, $-NR^3C(O)N(R^3)_2$, $-NR^3CO_2R^3$, $-NR^3NR^3C(O)R^3$, $-NR^3NR^3C(O)N(R^3)_2$, $-NR^3NR^3CO_2R^3$, $-C(O)C(O)R^3$, $-C(O)CH_2C(O)R^3$, $-CO_2R^3$, $-C(O)R^3$, $-C(O)N(R^3)_2$, $-OC(O)N(R^3)_2$, $-S(O)_2R^3$, $-SO_2N(R^3)_2$, $-S(O)R^3$, $-NR^3SO_2R^3$, $-NR^3SO_2N(R^3)_2$, $-C(=S)N(R^3)_2$, $-C(=NH)-N(R^3)_2$, $=O$, $=S$, $=NNHR^3$, $=NN(R^3)_2$, $=NNHC(O)R^3$, $=NNHCO_2(R^3)$, $=NNHSO_2(R^3)$, or $=NR^3$; and

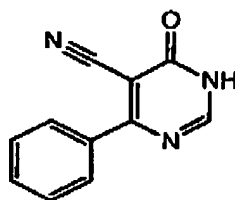
each R^3 is independently hydrogen or unsubstituted aliphatic; or

a pharmaceutical composition comprising said compound and a pharmaceutically acceptable carrier, adjuvant, or vehicle;

in an amount effective to treat or lessen the severity of stroke in said patient.

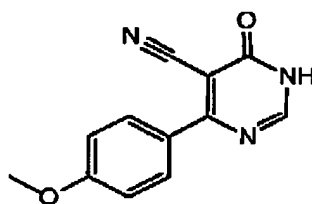
19. (Currently amended) The method according to either of claims 17 or 18, ~~any one of claims 16-18~~, wherein said method comprises administering to said patient compound I-1:

Applicants: Young-Choon Moon
Application No.: 10/799,507

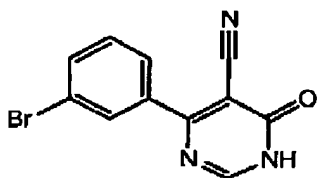


I-1

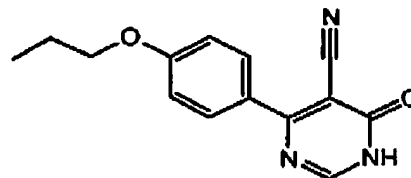
or a compound selected from:



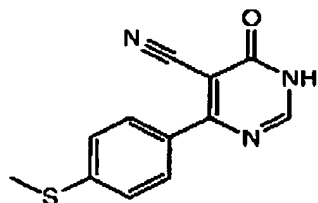
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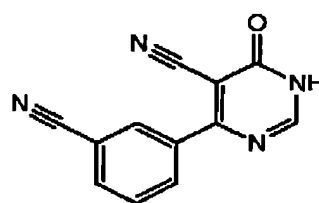
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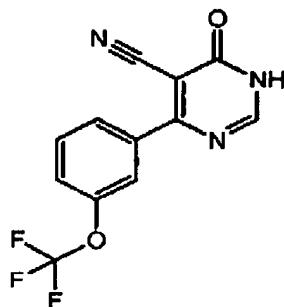
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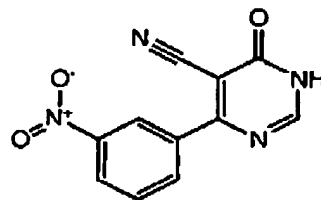
I-5



I-6

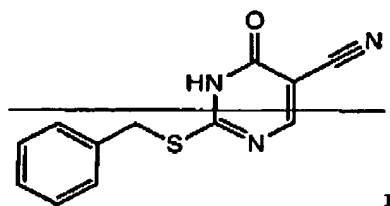


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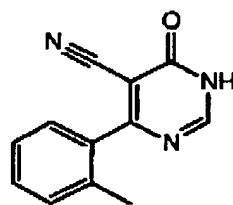


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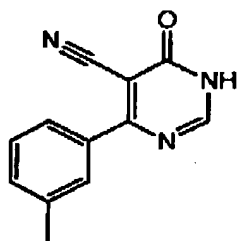
Applicants: Young-Choon Moon
Application No.: 10/799,507



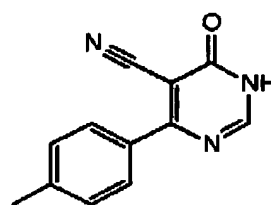
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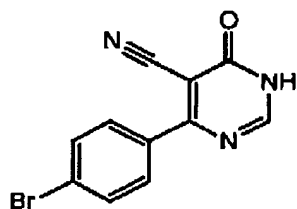
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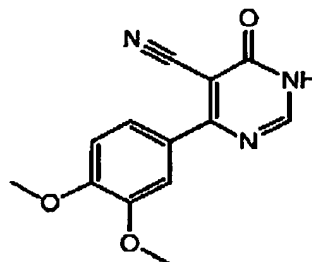
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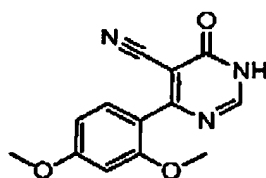
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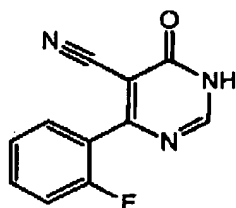
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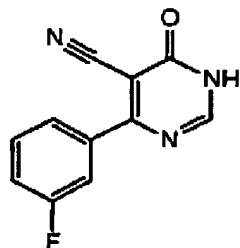
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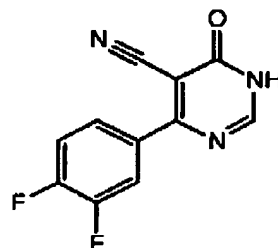
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I-16

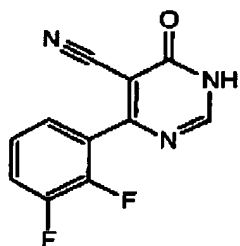


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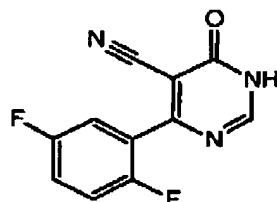


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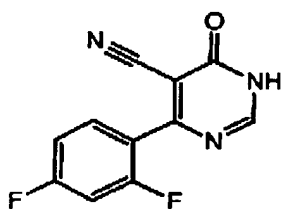
Applicants: Young-Choon Moon
Application No.: 10/799,507



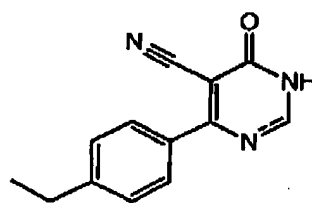
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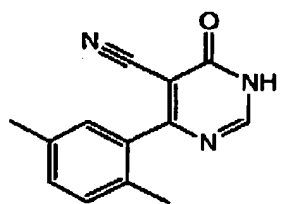
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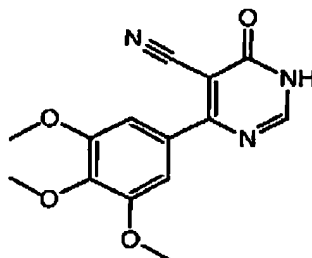
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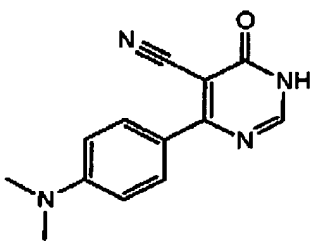
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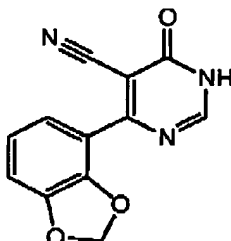
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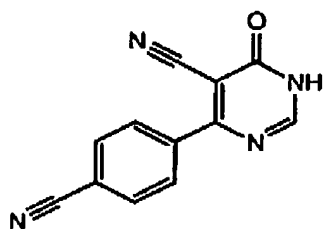
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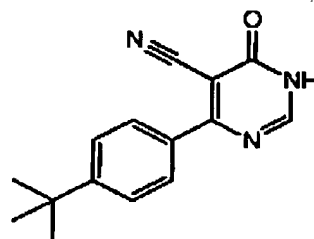
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I-26

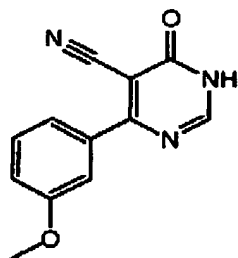


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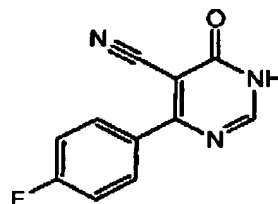


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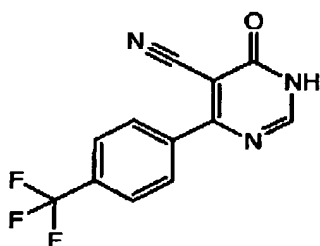
Applicants: Young-Choon Moon
Application No.: 10/799,507



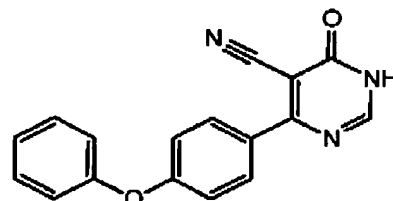
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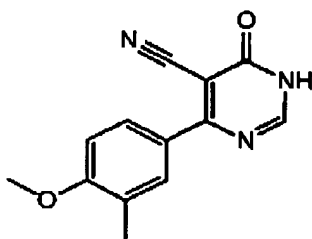
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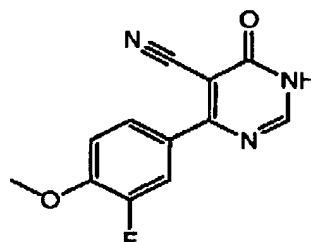
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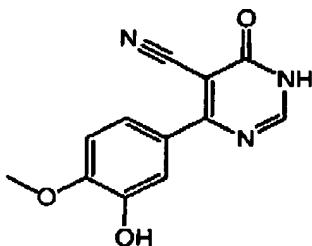
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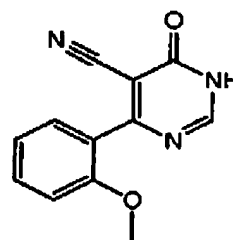
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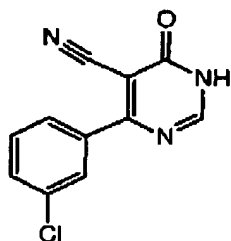
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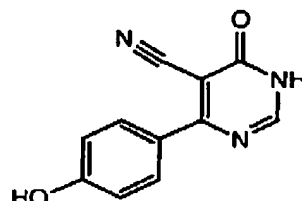
I-35



I-36

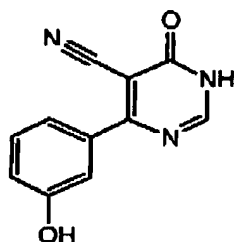


I-37

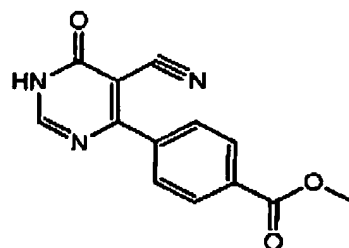


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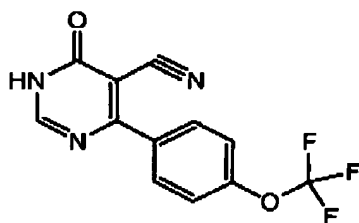
Applicants: Young-Choon Moon
Application No.: 10/799,507



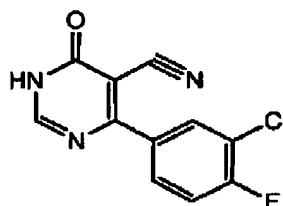
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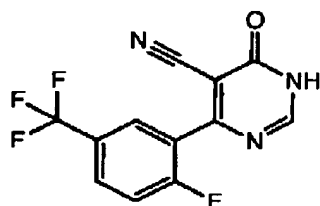
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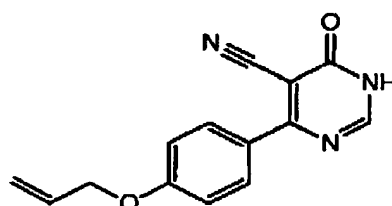
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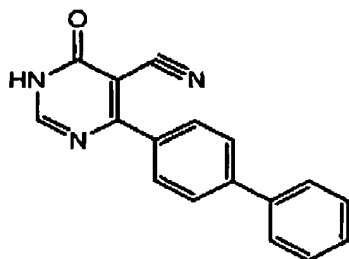
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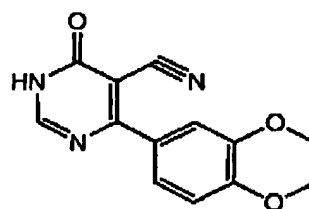
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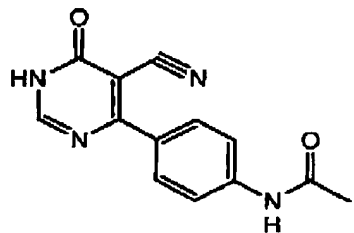
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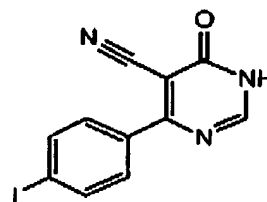
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I-46

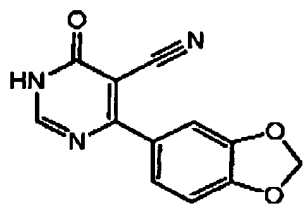
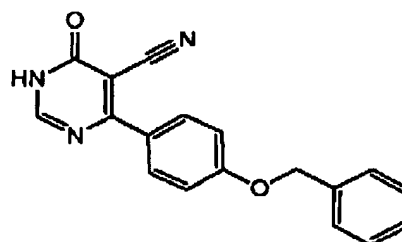
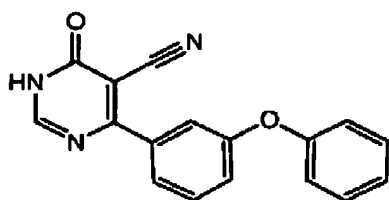
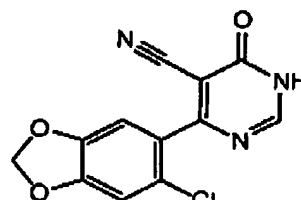
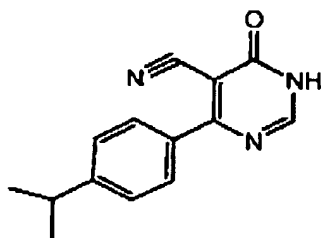
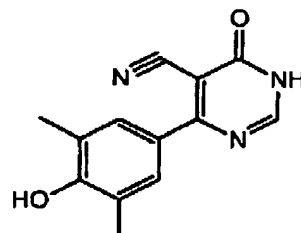
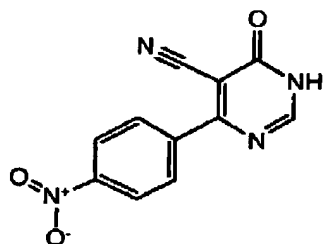
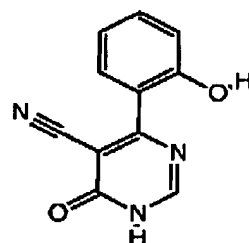
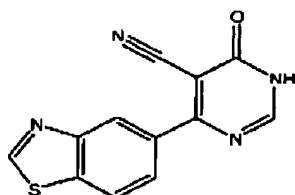
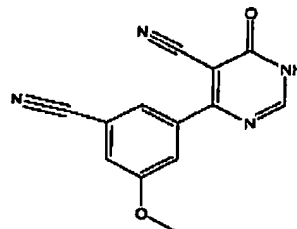


I-47

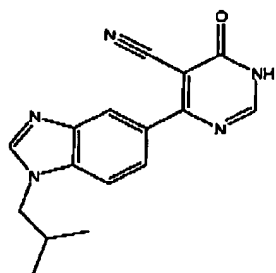
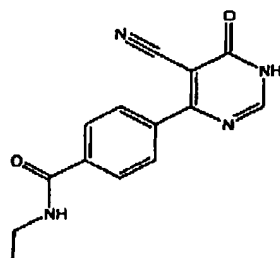
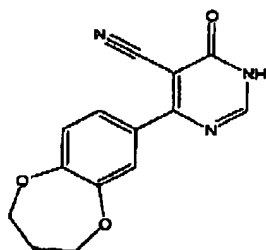
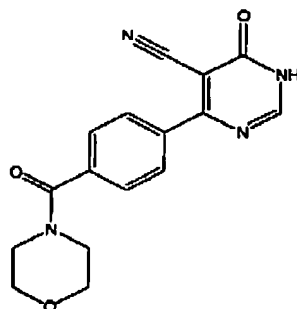
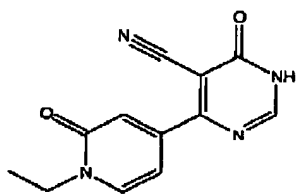
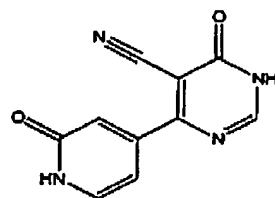
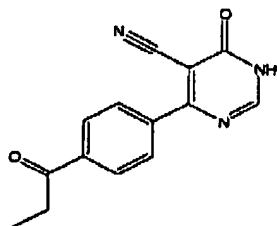
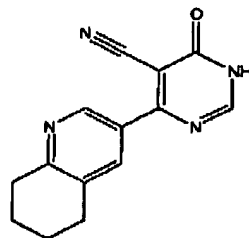


I-48

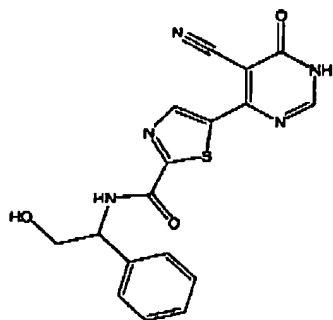
Applicants: Young-Choon Moon
Application No.: 10/799,507

**I-49****I-50****I-51****I-52****I-53****I-54****I-55****I-56****I-57****I-58**

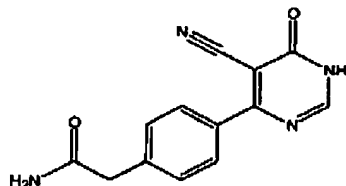
Applicants: Young-Choon Moon
Application No.: 10/799,507

**I-59****I-60****I-61****I-62****I-63****I-64****I-65****I-66**

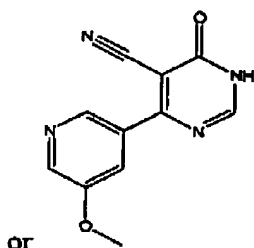
Applicants: Young-Choon Moon
 Application No.: 10/799,507



I-67



I-68



or

I-69, or [.]

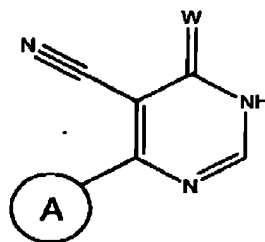
a pharmaceutical composition comprising said compound and a pharmaceutically acceptable carrier, adjuvant, or vehicle.

20. (Currently amended) The method according to either of claims 18 or 19, any one of claims 16-18, comprising the additional step of administering to said patient ~~an additional therapeutic agent selected from an anti-inflammatory agent, an immunomodulatory or immunosuppressive agent, a neurotrophic factor, an agent for treating cardiovascular disease, an agent for treating liver disease, an anti-viral agent, an agent for treating blood disorders, an additional therapeutic agent for treating diabetes, or an agent for treating immunodeficiency disorders, wherein:~~
~~—said additional therapeutic agent is appropriate for the disease being treated;~~
 and

said additional therapeutic agent is administered together with said composition as a single dosage form or separately from said composition as part of a multiple dosage form.

21. (Previously presented) A compound of formula I:

Applicants: Young-Choon Moon
 Application No.: 10/799,507



I

or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur;

ring A is a 5-6 membered heterocyclyl or heteroaryl ring having 1-4 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

wherein ring A is optionally substituted with 1-4 groups independently selected from halo, $-R^1$, $-OR^1$, $-SR^1$, $-NO_2$, $-CN$, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-NR^1C(O)N(R^1)_2$, $-NR^1CO_2R^1$, $-NR^1NR^1C(O)R^1$, $-NR^1NR^1C(O)N(R^1)_2$, $-NR^1NR^1CO_2R^1$, $-C(O)C(O)R^1$, $-C(O)CH_2C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-OC(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-S(O)R^1$, $-NR^1SO_2R^1$, $-NR^1SO_2N(R^1)_2$, $-C(=S)N(R^1)_2$, $-C(=NH)N(R^1)_2$, $=O$, $=S$, $=NNHR^1$, $=NN(R^1)_2$, $=NNHC(O)R^1$, $=NNHCO_2(R^1)$, $=NNHSO_2(R^1)$, or $=NR^1$, wherein two independent occurrences of R^1 , on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 3-8 membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^1 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^1 except hydrogen is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, $-CN$, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)N(R^2)_2$, $=O$, $=S$, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2 , on the same substituent or

Applicants: Young-Choon Moon

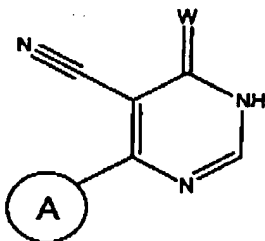
Application No.: 10/799,507

different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-R^3$, $-OR^3$, $-SR^3$, $-NO_2$, $-CN$, $-N(R^3)_2$, $-NR^3C(O)R^3$, $-NR^3C(O)N(R^3)_2$, $-NR^3CO_2R^3$, $-NR^3NR^3C(O)R^3$, $-NR^3NR^3C(O)N(R^3)_2$, $-NR^3NR^3CO_2R^3$, $-C(O)C(O)R^3$, $-C(O)CH_2C(O)R^3$, $-CO_2R^3$, $-C(O)R^3$, $-C(O)N(R^3)_2$, $-OC(O)N(R^3)_2$, $-S(O)_2R^3$, $-SO_2N(R^3)_2$, $-S(O)R^3$, $-NR^3SO_2R^3$, $-NR^3SO_2N(R^3)_2$, $-C(=S)N(R^3)_2$, $-C(=NH)-N(R^3)_2$, $=O$, $=S$, $=NNHR^3$, $=NN(R^3)_2$, $=NNHC(O)R^3$, $=NNHCO_2(R^3)$, $=NNHSO_2(R^3)$, or $=NR^3$; and

each R^3 is independently hydrogen or unsubstituted aliphatic.

22. (Previously presented) A compound of formula I:

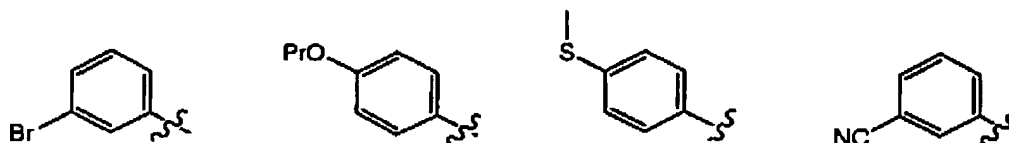


I

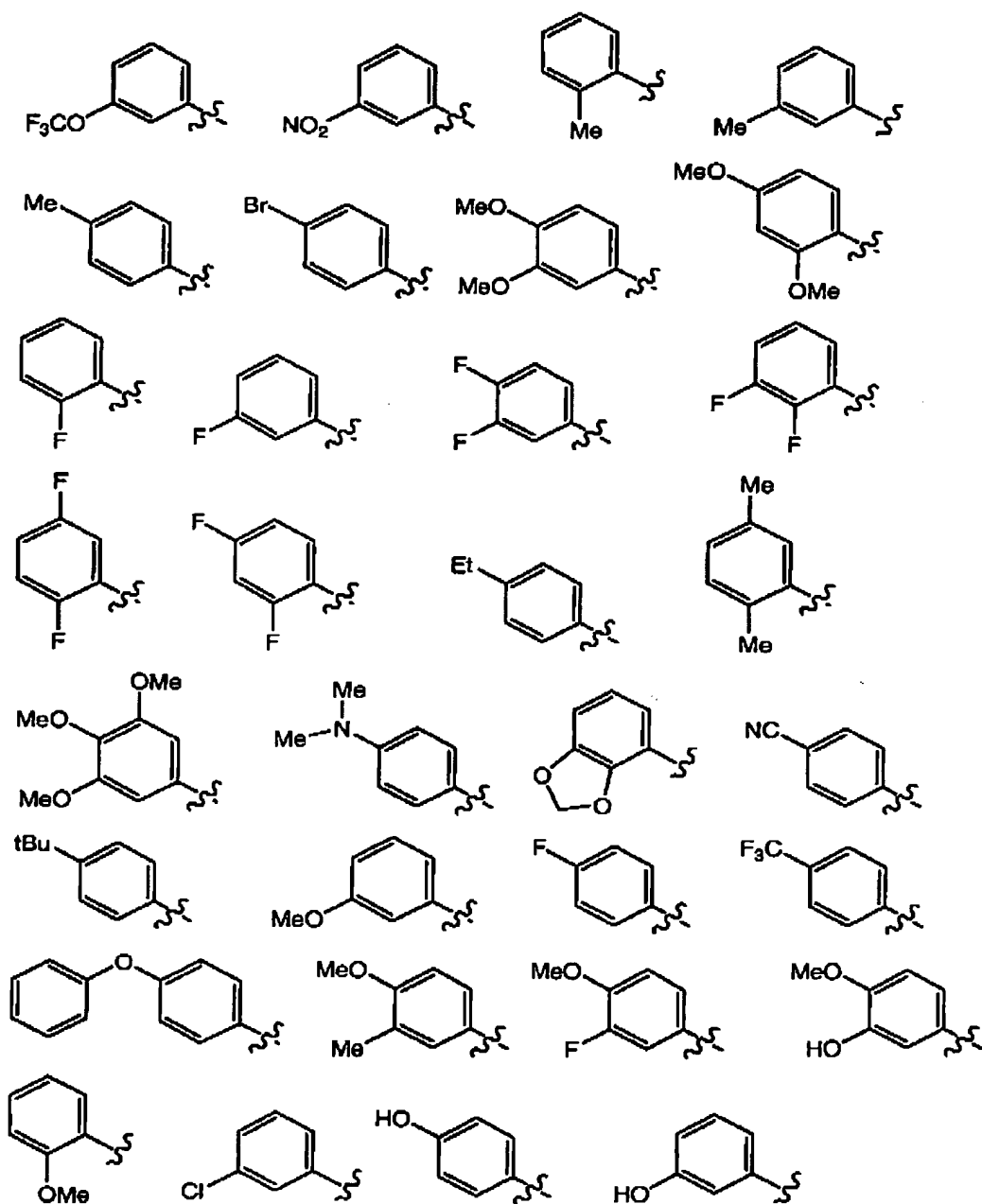
or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur; and

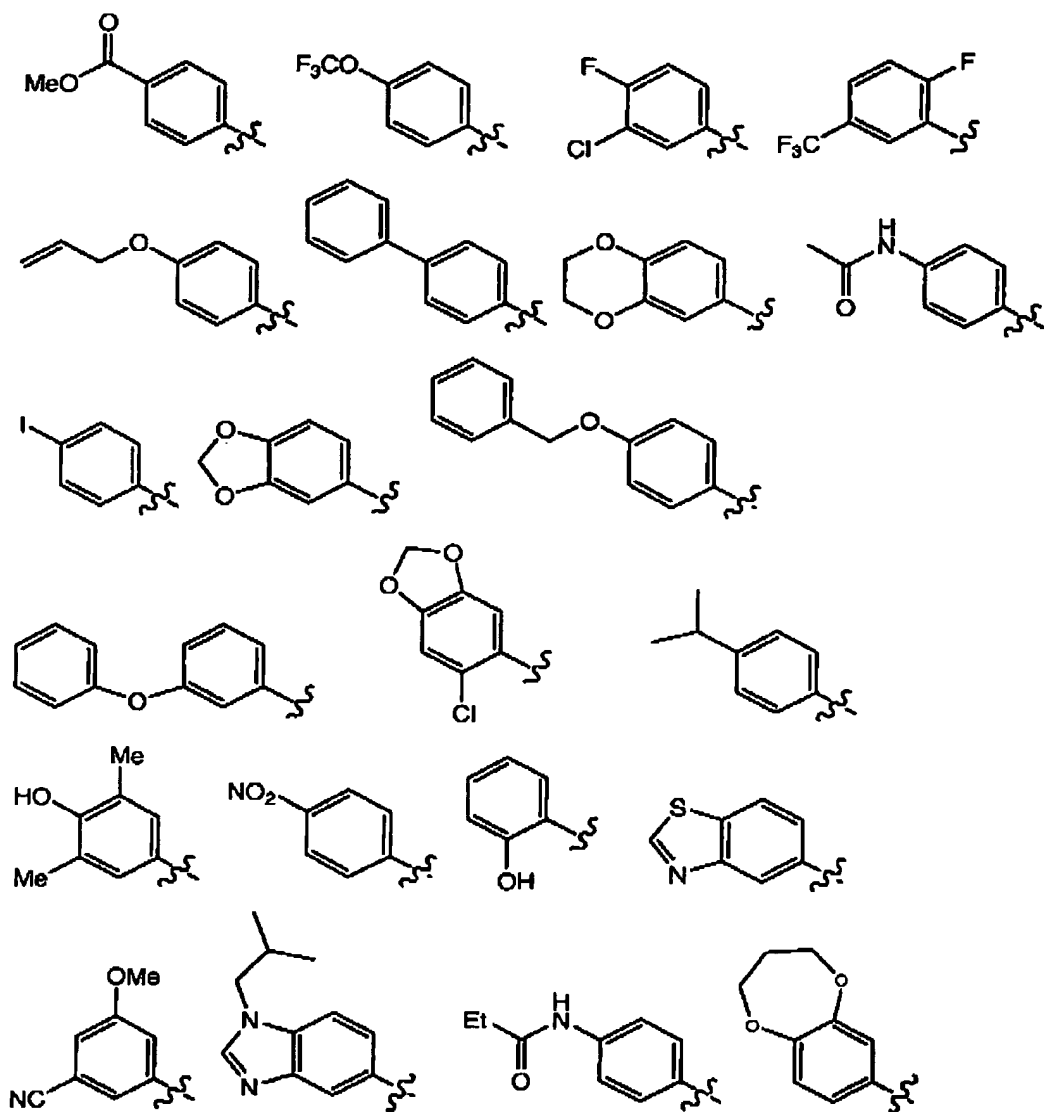
ring A is selected from:



Applicants: Young-Choon Moon
Application No.: 10/799,507



Applicants: Young-Choon Moon
Application No.: 10/799,507



Applicants: Young-Choon Moon
Application No.: 10/799,507

